

# I (WE) CLAIM:

1. A method for setting parameters for contrast agent medical imaging, the method comprising:
  - (a) setting a transmit level; and
  - (b) automatically selecting a setting for at least one contrast agent imaging parameter as a function of the transmit level, the at least one contrast agent imaging parameter being selected from the group of: transmit sequence, detection technique, transmit modulation frequency, transmit bandwidth, transmit coding, number of transmit foci per scan line, number of transmit pulses per scan line, number of transmitted lines per image, time between transmissions, velocity scale, reverberation-suppression pulses, receive bandwidth, receive demodulation frequency and combinations thereof.
2. The method of Claim 1 wherein (a) comprises setting the transmit level by a user input with a single control.
3. The method of Claim 1 wherein (a) comprises setting the transmit level automatically by a processor in response to a measurement.
4. The method of Claim 1 further comprising:
  - (c) measuring a characteristic of received signals responsive to the transmit level;
  - wherein (b) comprises selecting the setting as a function of the measured characteristic of (c).
5. The method of Claim 1 further comprising:
  - (c) measuring a characteristic of received signals responsive to the transmit level;
  - wherein (b) comprises selecting one of the setting and a system gain as a function of the measured characteristic of (c).

6. The method of Claim 1 wherein (b) comprises selecting the setting of the transmit sequence, the transmit sequence including a number of pulses, a phase of pulses and an amplitude of pulses.
7. The method of Claim 6 wherein (b) comprises selecting one of:
  - (b1) multiple transmit pulses with interpulse amplitude and phase modulation;
  - (b2) multiple transmit pulses having a same amplitude and phase;
  - (b3) multiple transmit pulses with interpulse amplitude modulation; and
  - (b4) multiple transmit pulses with interpulse phase modulation.
8. The method of Claim 1 further comprising:
  - (c) providing two or more transmit level setting available as a set of user-accessible options for the setting of (a), each of the transmit level settings incorporating the setting of (b).
9. The method of Claim 1 wherein (b) comprises selecting settings for at least three of the contrast agent imaging parameters.
10. The method of Claim 1 wherein (a) comprises setting the transmit level as one of at least a low, a medium and a high transmit level, and wherein (b) comprises selecting settings of:
  - (b1) for the low transmit level, the transmit sequence having multiple pulses with at least one of different amplitudes and phases, and one of (i) the transmit modulation being low and (ii) the receive demodulation frequency being medium;
  - (b2) for the medium transmit level, the transmit sequence having multiple pulses with at least one of different amplitudes and phases, and one of (i) the transmit modulation being medium and (ii) the receive demodulation frequency being high; and

(b3) for the high transmit level, the transmit sequence having multiple pulses with all pulses having one of a same amplitude and a same phase, and one of (i) the transmit modulation being high and (ii) the receive demodulation frequency being low.

11. The method of Claim 1 wherein (a) comprises setting the transmit level as one of at least a low and a high transmit level, and further comprising:

- (c) allowing acquisition of velocity information in addition to contrast agent detection for the low transmit level;
- (d) allowing velocity scale adjustment for the low transmit level; and
- (e) preventing acquisition of velocity information in addition to contrast agent detection for the high transmit level.

12. A method for setting parameters for contrast agent medical imaging, the method comprising:

(a) automatically adjusting from a first contrast agent detection technique to a second contrast agent detection technique, the first contrast agent detection technique different than the second contrast agent detection technique; and

(b) performing (a) in response to a change in a transmit level.

13. The method of Claim 12 wherein (a) comprises adjusting from the first contrast agent detection technique having one of a different transmit sequence and a different receive weighting of received echoes than the second contrast agent detection technique.

14. The method of Claim 12 wherein (a) comprises adjusting between one of: transmitting at least two pulses 180 degrees out of phase with a same amplitude along a same scan line, determining flow energy, detecting fractional harmonics, transmitting pulses adapted for contrast agent destruction with intermittent detection of contrast agents, and transmitting identical transmit pulses; and one of:

transmitting at least two pulses with different amplitudes along a same scan line, transmitting with different phasing as a function of scan line, and transmitting at least two pulses with different phasing along a same scan line.

15. The method of Claim 12 further comprising:

(c) automatically selecting a setting for at least one contrast agent imaging parameter as a function of the change in the transmit level, the at least one contrast agent imaging parameter being selected from the group of: transmit modulation frequency, transmit bandwidth, transmit coding, number of transmit foci per scan line, number of transmit pulses per scan line, number of transmitted lines per image, time between transmissions, velocity scale, reverberation-suppression pulses, receive bandwidth, receive demodulation frequency and combinations thereof.

16. The method of Claim 12 wherein (b) comprises performing (a) in response to a user adjustment of a single user control.

17. The method of Claim 12 wherein (b) comprises performing (a) in response to an automatic adjustment of the transmit level.

18. The method of Claim 12 further comprising:

(c) providing a contrast agent imaging configuration on a system, the contrast agent imaging configuration associated with at least the first and second contrast agent detection techniques.

19. A method for setting parameters for contrast agent medical imaging, the method comprising:

(a) configuring a system for contrast agent imaging; and  
(b) altering transmit level and transmit sequence for the contrast agent imaging in response to a single user input control, at least two different transmit levels being associated with at least one of the transmit sequences.

20. The method of Claim 19 wherein (a) comprises selecting by a user of a contrast agent imaging configuration associated with at least the first and second contrast agent detection techniques, the first contrast agent detection technique having a different transmit sequence than the second contrast agent detection technique.

21. The method of Claim 19 wherein (a) comprises setting the transmit level, the transmit sequence, the transmit modulation frequency and the receive demodulation frequency, and (b) comprises altering the transmit level, the transmit sequence, the transmit modulation frequency and the receive demodulation frequency in response to the single user input control.

22. The method of Claim 19 further comprising:

(c) altering the transmit level without altering the transmit sequence in response to further adjustment of the single user input control.

23. The method of Claim 19 further comprising:

(c) automatically altering a setting for at least one contrast agent imaging parameter as a function of the alteration of (b), the at least one contrast agent imaging parameter being selected from the group of: transmit modulation frequency, transmit bandwidth, transmit coding, number of transmit foci per scan line, number of transmit pulses per scan line, number of transmitted lines per image, time between transmissions, velocity scale, reverberation-suppression pulses, receive bandwidth, receive demodulation frequency, transmit coding, reverberation-suppression pulses, size of scan region and combinations thereof.

24. A system for setting parameters for contrast agent medical imaging, the system comprising:

a user input control;

a memory operable to store a table of a plurality of transmit sequences and a plurality of transmit levels, at least two transmit levels associated with at least one of the transmit sequences; and

a processor operable to select different ones of the plurality of transmit sequences and of the plurality of transmit levels in response to a single input from the user input control.

25. The system of Claim 24 wherein the user input control comprises a one of a rotatable knob, a touch screen control, and a button.

26. The system of Claim 25 wherein the processor is operable to select from a range of transmit levels and at least two different transmit sequences in response to actuation of the user input control, a first of the at least two transmit sequences associated with lower transmit levels and a second of the at least two transmit sequences associated with higher transmit levels.

27. The system of Claim 24 wherein the table includes settings for each of the transmit levels of transmit modulation frequency, transmit bandwidth, transmit coding, number of transmit foci per scan line, number of transmit pulses per scan line, number of transmitted lines per image, time between transmissions, velocity scale, reverberation-suppression pulses, receive bandwidth, receive demodulation frequency and combinations thereof.

28. The system of Claim 24 wherein the processor is operable to obtain a measure of contrast agent response and automatically select at least one of the different one of (i) the plurality of transmit sequences and (ii) of the plurality of transmit levels in response to the measure.

29. The system of Claim 24 wherein each transmit sequence includes a number of pulses, a phase of pulses and an amplitude of pulses for each scan line.

30. The system of Claim 24 wherein a first of the plurality of transmit sequences has multiple transmit pulses with interpulse amplitude modulation for each of a plurality of scan lines and a second of the plurality of transmit sequences

has multiple transmit pulses having a same amplitude and phase for each of the plurality of scan lines.

31. The system of Claim 24 wherein the at least two transmit levels comprises at least three transmit levels, the at least three transmit levels being a low, a medium and a high transmit level, and wherein the processor is operable to select settings of:

for the low transmit level, the transmit sequence having multiple pulses with at least one of different amplitudes and phases, the transmit modulation being low and the receive demodulation frequency being medium;

for the medium transmit level, the transmit sequence having multiple pulses with at least one of different amplitudes and phases, the transmit modulation being medium and the receive demodulation frequency being high; and

for the high transmit level, the transmit sequence having multiple pulses with all pulses having one of a same amplitude and a same phase, the transmit modulation being high and the receive demodulation frequency being low.